ADSC/WSDOT Meeting Minutes
24 January 2008

Team Members in Attendance

Name	Company	Telephone	E-mail
Allen, Tony	WSDOT	360-709-5450	allent@wsdot.wa.gov
Armour, Tom	DBM	253-838-1402	tarmour@dbmcm.com
Bauer, Mike	WSDOT	360-705-7190	bauerm@wsdot.wa.gov
Carnevale, Bob	DBM	253-838-1402	rcarnevale@dbmcm.com
Clarke, Patrick	WSDOT	360-705-7220	clarkp@wsdot.wa.gov
Cuthbertson, Jim	WSDOT	360-709-5452	cuthbej@wsdot.wa.gov
Dybevik, Eric	CJA	206-575-8248	edybevik@condon-johnson.com
Etheridge, Mark	DMI	206-793-3951	mark@dmidrilling.com
Frye, Mark	WSDOT	360-709-5469	fryem@wsdot.wa.gov
Gaines, Mark	WSDOT	360-705-7827	gainesm@wsdot.wa.gov
Macnab, Alan	CJA	206-575-8248	amacnab@condon-johnson.com
Morin, Don	D.M.I.	253-891-1311	don@dmidrilling.com
Nicholas, Cathy	FHWA	360-753-9412	Cathy.nicholas@fhwa.dot.gov
Niemi, Mike	WSDOT	360-705-6980	niemim@wsdot.wa.gov
Rasband, Al	Malcolm Drilling	253-395-3300	arasband@malcolmdrilling.com
Sexton, Jim	DBM	253-838-1402	jims@dbmcm.com
Sheikhizadeh, Mo	WSDOT	360-705-7828	sheikhm@wsdot.wa.gov
Starcevich, John	Malcolm Drilling	253-395-3300	jstarcevich@malcolmdrilling.com
Tuttle, John	Sinclair Serv.	661-212-1223	tutmud@aol.com

Guests

Name	Company	Telephone	E-mail
Clements, Steve	Boart Longyear	801-556-7200	
Lewis, Ron	WSDOT	360-705-7396	lewisr@wsdot.wa.gov
Martinez, Christina	WSDOT	360-705-7448	martinezc@wsdot.wa.gov
Moore, Tim	WSDOT	360-705-7163	mooret@wsdot.wa.gov
Tran, Lou	WSDOT	360-705-7195	tranluo@wsdot.wa.gov

The meeting began at 8:30 AM.

1. Constructability Review

Purdy Creek Bridge

WSDOT Geotech handed out a plan view and geotechnical data for this project. This project is a three-span replacement structure that will require two 8'-0" diameter shafts at

each pier. Site soils consist of 30-50 feet of loose material with a high water table, followed by stiffer material starting at about El. -20. This stiffer layer is underlain by more loose material. The shafts are expected to tip out at between El. -70 and El. -100.

Most ADSC Members agreed that casing would be necessary to get through the wet, loose material near the top of the shaft. They also generally agreed that the deeper loose layer could be handled using synthetic slurry. All ADSC Members were satisfied with the original Table 5 that was provided as part of the review package.

Action Plan:

- Alan to provide formal written comments to Mo within 10 days.

I-90 Widening

Ron Lewis from WSDOT Bridge and Structures provided a summary of the upcoming I-90 widening project. This project will widen I-90 east of Snoqualmie Pass from four lanes to six lanes. It involves the construction of 10 new bridges and a new snow shed structure. The new construction will use a slightly different route from the current alignment. The total duration of this project will be approximately five years. Tim is specifically looking for feedback on construction of the new snow shed.

This project will construct an 1100 foot long snow shed to replace the current 500 foot long shed. Tim provided a handout showing schematic details of the project. Shaft construction includes 45 8'-0" diameter shafts that are 25 feet on center and parallel I-90 to the east. A cap will be constructed on the shafts, and transverse W93 prestressed girders will form the roof of the snow shed. This project will need to be constructed during 6-8 month construction windows.

Alan suggested raising the water level in the lake to allow the shafts to be installed from a barge. Bridge responded that the State has no control over the lake levels. Several ADSC Members expressed concern about only having a 30-foot wide access road. During shaft drilling, access will be blocked by drill equipment. Al R. asked if the temporary soil nail wall could be moved to provide a wider access. The Bridge Office agreed this could be shifted. ADSC suggested a 40-foot wide access road would be more workable. It was also pointed out that these shafts will need to be drilled by an oscillator, and a pile system will be required to support the drilling equipment. It was suggested that micropiles would work well for oscillator support.

Bridge asked if the shaft construction could be completed in a single season. With the access road constructed ahead of time, there was general agreement this could be done in one season. This would require multiple drilling machines working simultaneously.

Action Plan:

- Alan to provide formal written comments to Mo within 10 days.

Columbia River

Tim Moore from the Bridge Office handed out conceptual drawing of the new Columbia River Crossing. So far, the foundation design has focused on large-diameter driven piles. Tim wanted to explore the possibilities of using drilled shafts for the foundation.

The Oregon side of the structure poses the greatest challenge. The soils consist of 200 feet of loose soils above the Troutdale formation. The design will require the shafts to be approximately 220 feet long, tipped in the Troutdale. Tim asked about feasibility of constructing large diameter shafts of this length.

One ADSC Member mentioned that AGRA Foundations had constructed 8'-0" diameter, 180 foot long drilled shafts at the Bonneville Dam. Kelly bars on drill rigs are capable of drilling to at least 260 feet, so theoretically these deep shafts could be constructed. Tom Armour suggested that shafts may be more expensive than a driven pile foundation. Jim C. mentioned that because these holes will be open for a significant amount of time, it may be necessary to require permanent casing. Both conventional and rotating methods are feasible options.

Ron Lewis asked if all the cans could be first vibrated into place, and then a work platform erected at the top of the cans. ADSC agreed that this could be done, however if the cans can't be vibrated to tip without relieving, it would present a serious challenge. Tim asked if tip grouting would be an option here. Tony Allen didn't feel tip grouting would provide much benefit in the Troutdale Formation. ADSC recommended avoiding shafts larger than ten feet in diameter.

Action Plan:

- Alan to provide formal written comments to Mo within 10 days.

2. Environmental Discussion

Christina Martinez, the WSODT Environmental Services Office Compliance Branch Manager, was introduced to the Task Force. She has been with the DOT for 10 years, but was just recently hired for this position. A copy of an email from Christina to Mo was handed out to the Task Force. To summarize the email, there is no reason why a small amount of concrete waste deposited on the ground in dry conditions would be an environmental violation. In wet/rainy conditions where runoff from this material could enter a body of water, it could be a violation.

Alan mentioned that they have been required to place diapers around concrete lines and pumps. Christina was not aware of reasons why this would be required. Jim Sexton suggested that a specification or other written documentation could help describe what is and isn't acceptable. Christina responded that environmental permit conditions change from one project to the next. It would be difficult to write a universal specification that could be used on all projects. It was suggested that the environmental aspects of the construction should be discussed at the drilled shaft preconstruction meeting.

Al R. invited Christina out to a job site to see the challenges first-hand. John Tuttle also offered assistance with respect to any slurry issues. The Task Force suggested having

Christina make a presentation at the upcoming joint training. Christina agreed to this, and will try to bring some people from Ecology along.

Action Plan:

- Al/Mo to add Christina to the joint training agenda.

3. Review/Approval of 15 November 07 Meeting Minutes

The meeting minutes were accepted/approved with no comments.

Action Plan:

- No action needed.

4. Action Item Reports

i. Soldier Pile Lagging Specification Final Draft

Copies of the latest revisions to the soldier pile specifications were handed out for review. Alan expressed concern that the proposed Specification allows excavation of up to five feet below the permanent ground anchor level prior to stressing. He thought this was too far, and suggested allowing three feet instead.

Jim C. mentioned that this table won't work for every application everywhere. There may be situations where site soils require different lagging criteria. There was some disagreement; some ADSC Members felt that this table should always be applicable.

There was discussion about the specifics of the table. It was questioned why the table was being re-written in the WSDOT Specification. Some differences were pointed out between this table and Jaworski's table. It was also suggested that the soil classifications should be added to the Specification. Jim and Mike will make revisions and put together another draft for review at the next meeting.

Action Plan:

- Jim & Mike revise the proposed specification to incorporate the comments from the meeting.
- Mo to put this item on the agenda for the next meeting.

ii. Proposed Changes to Section 3.03 (side caving responsibility)

Mike B. has made changes to the Special Provision to clarify that this is the Contractor's responsibility. The Task Force agreed with this change.

Action Plan:

- No action needed.

iii. Overnight Protection of Shafts

The language agreed to by the Task Force has been added to the Special Provisions.

Action Plan:

- No action needed.

iv. Clarifying Language for Placement of Excess Temporary Casing

The Payment section of the Special Provision has been modified to clarify that temporary casing added for the Contractor's convenience is not compensable.

Action Plan:

- No action needed.

v. Shaft Contractors' Prequalification Class

Mo handed out an email from Ken Walker. A new class has been established that will allow Drilled Shaft Contractors to be prime bidders on projects where the majority of the contract is drilled shaft construction.

Action Plan:

- No action needed.

vi. New Non-destructive Testing Research

Mo provided the Task Force with an update on upcoming non-destructive testing research. The State has awarded this research to Prof. Mullen of the University of South Florida. This research will evaluate testing that uses infrared probes to sense the temperature of the shaft during concrete hydration. Preliminary work in this area has shown that anomalous regions can be identified by the lower temperatures they produce. A thermal plot identifies the approximate limits of any anomalous areas. This testing normally needs to be performed within 12 hours of concrete placement.

Mo should be receiving a full research proposal soon. He will provide the Task Force with updates as the research progresses.

Action Plan:

- Mo to provide update at next meeting.

vii. New Vibration Specification

Mo handed out the proposed revisions to the vibration specification discussed at the last meeting. Alan expressed concern about this revision. The Class 4000P concrete typically achieves 1000 psi in about four days (96 hours). This revision would result in a delay of 24 hours beyond what the current Specification requires.

Most ADSC Members had concerns with the proposed change, but they understand the importance of this issue. There was some discussion that the actual

strength of the concrete in the shaft may be much greater than the test cylinders due to the heat of hydration. Mo speculated that perhaps maturity meters could be used to predict the actual strength of the in-place concrete. The ADSC members will consider this further, and will discuss this proposal again at the next meeting.

Action Plan:

- Mo to include on agenda for next meeting.

5. PGA Access Hole Pipe Reinforcing

Mark E. recently had difficulty getting WSDOT approval for shipping tie-back soldier piles. There is not always great fit-up between the steel pipe stiffener and the flanges of the pile, and no weld is required on the internal faces of the flange where the pipe penetrates. Because the edges are flame-cut, the connection can look rough. This has been grounds for not approving these in the past. Mark asked the State to consider adding a weld to the inside faces of the flange at the pipe intersection or accept minor gaps between the pipe reinforcement and inside face of the flanges. Mo will investigate.

Action Plan:

- Mo to investigate and report back at the next meeting.

6. Splice Zone Concrete

Currently shaft/column splice zones are shown to use Class 4000 concrete. The State is considering changing this to Class 4000P to help improve consolidation of the concrete through the heavily reinforced shaft and column cages. Mo asked ADSC if there were any concerns with this change. No one expressed any concern.

Action Plan:

- Mo will ask Bridge Design to require class 4000P in the splice zones.

7. Over-drilling, Quarry Rock Placement, and Cage Racking Concerns

WSDOT has recently seen several projects where shaft rebar cages have settled even when quarry spall rock was placed at the tip of the shaft. It appears that the use of quarry spalls doesn't solve the problem of shaft cage settlement. The State is also concerned with uneven settlement of the cage that could result in racking of the cage. In some of the photos from the field, when cages settle, the tops of the bars sticking out of the shafts vary in elevation. Mo asked the ADSC Members for input.

ADSC acknowledged that occasionally a cage will rack. It is also observed that sometimes the ends of the bars at the top of the cage are not initially cut to a uniform elevation. After concrete is placed, the cage may look like it has racked but it may actually be due to uneven bar lengths.

Some ADSC Members had found that adding bar boots to the bottom of the cages helps minimize settlement when quarry spalls are used. All ADSC Members agreed that it would be beneficial to add this to the Special Provisions.

Action Plan:
Mike will add a segment to the Specials requiring rebar boots or acceptable alternate base plates to the cage tips to prevent cage settlement when quarry spalls are used

8. New Shaft BSP for Sign Bridges and Luminaires
Mike B. handed out a Special Provision that has been used in the past on traffic signal drilled shafts. The State intends to begin using this Special Provisions for sign bridge and cantilever sign structure drilled shafts.

Al R. suggested clarifying what is meant by "Water Slurry (with or without site soils.)" It is not clear what this means. Mark E. commented that this change will significantly increase unit prices for these shafts. These shafts are often installed in the median or shoulders of existing roads. To construct these using conventional drill rigs will require nighttime lane closures and concrete placement. Considering small quantities of night-delivered concrete, the unit prices will be substantial.

Mo asked the group to review this specification further and bring any comments to the next Task Force meeting.

Action Plan:
- Mo to put on agenda for the next meeting.

9. End of Year Shaft Report
Mo is still working on putting this report together. He will provide this at the next Task Force meeting.

Action Plan:
- Mo to put on agenda and provide report at the next meeting.

10. Joint Training Planning
Alan will be coordinating the joint training. This year the training will be held on the west side of the state only. The Task Force agreed to hold the training on April 15th. The committee to plan this training includes John Tuttle, Mark Etheridge, Bob Carnevale, John Starcevich, Mohammad Sheikhizadeh, Mark Frye, and Patrick Clarke.

Action Plan:
- Alan to coordinate with committee for joint training.

The meeting was adjourned at 11:30 am.